

T07D01 – (7.2.(4-5)) Position of Equilibrium

Name

4. 7.2.4 State and explain the effect of a catalyst on an equilibrium reaction. (3)

a. Review: explain what a catalyst is and what it does:

5. 7.2.5 Apply the concepts of kinetics and equilibrium to industrial processes. (2)

a. Haber Process:

i. State the use and purpose nitrogen containing compounds, list a few:

ii. The end goal of the Haber Process is to produce ammonia, there are several steps to this process, starting with methane provide the main parts to the process:

1. What must be removed from methane? Why?

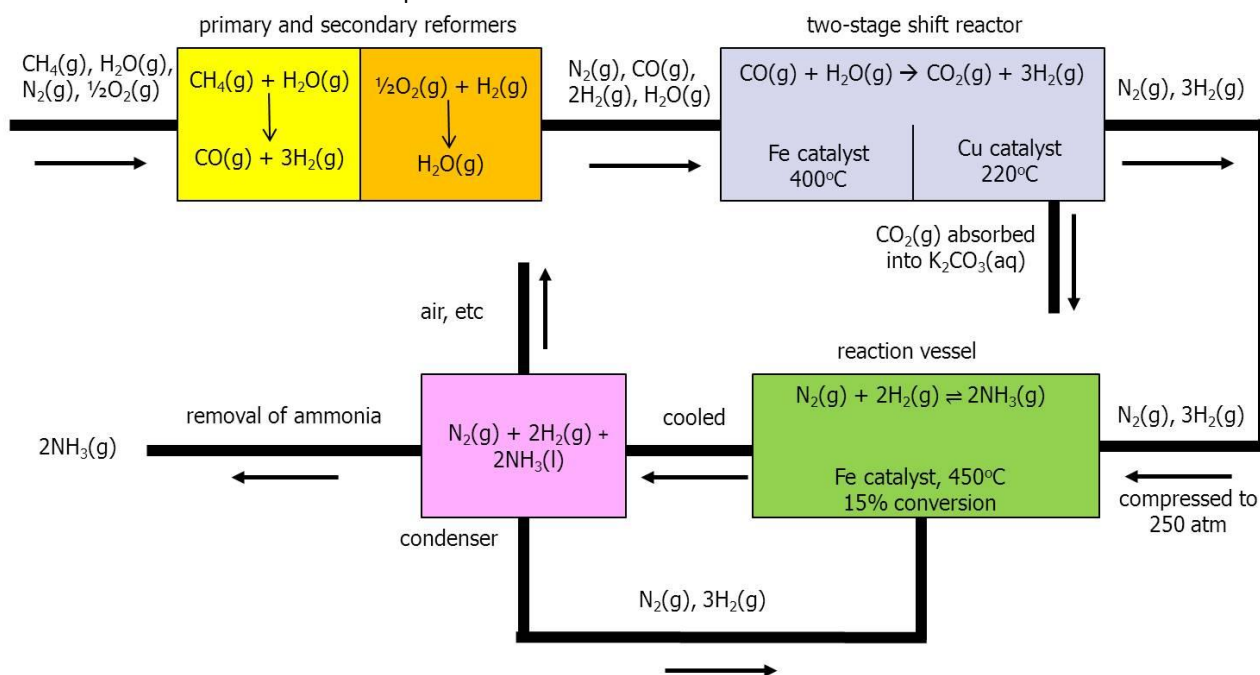
2. Methane reacts with water, provide the equation (don't forget the catalyst):

3. What must be removed after the reaction of methane?

4. What must be done to air before N_2 can be added to H_2 ?

5. Give the equation for the equilibrium reaction to produce ammonia:

iii. The Haber Process is presented below:



iv. According to Le Chatelier's principle what are the optimum conditions for a greater yield in ammonia, why?

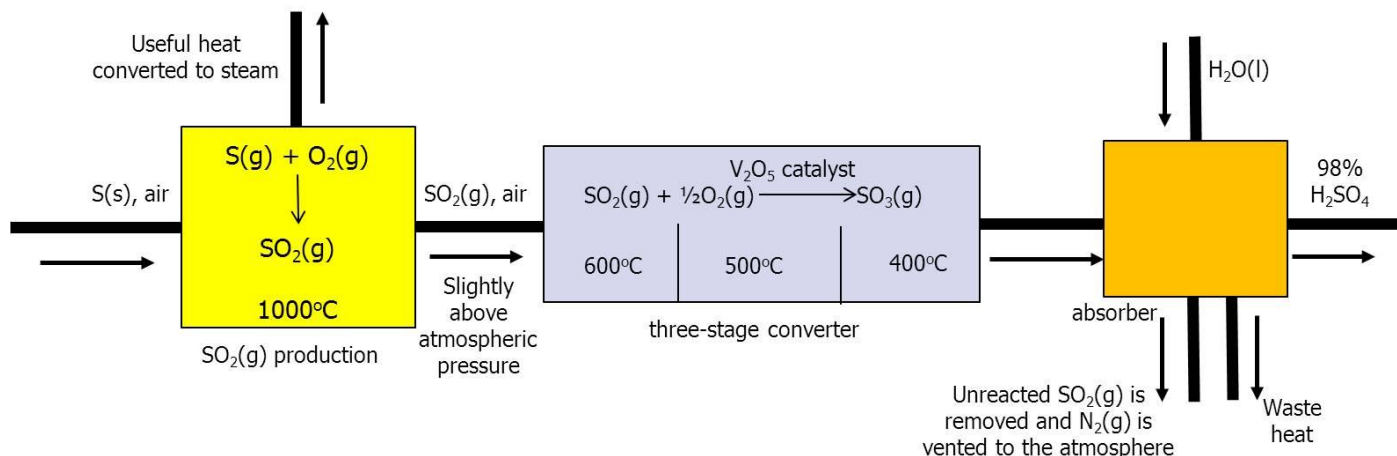
v. This is not followed, explain using pressure, temperature, and a catalyst

vi. What is the catalyst used for the final step? What does chemisorption mean?

b. The Contact Process:

i. Why is the production of sulfuric acid so important?

ii. Below is a diagram of the contact process:



iii. Stage 1:

iv. State 2: state the optimum conditions based on Le Chatelier's Principle, then state what the actual conditions are, and why:

v. Stage 3: